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10/712,138	11/14/2003	Chih-Ta Star Sung		8199

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Chih-Ta Star Sung	FINDLEY, CHRISTOPHER G
RM. 308, BLD. 52, NO. 195, CHUNG HSING RD.	

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SEC. 4, CHU TUNG TOWNSHIP
HSINCHU COUNTY, 310
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>23 October 2007</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12,16-18 and 20* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12, 16-18, and 20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1. The Examiner notes that claims 13-15, 19, and 21 have been cancelled via the Applicant's amendment filed 10/23/2007.

Response to Arguments

2. Applicant's arguments with respect to claims 1-12, 16-18, and 20 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-12, 16-18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Owen et al. (US 6028635 A) in view of Wee et al. (US 6697061 B1).

Re **claim 1**, Owen discloses a method for decoding a video stream, comprising: applying the variable length decoding scheme to decode the video bit stream and block by block recovering the DCT coefficients and dequantizing the coefficient by multiplying the quantization table and inverse transforming the DCT coefficients to matrix of pixel values (Owen: column 7, line 54, through column 8, line 6); VLD decoding video stream

and maintaining a DCT coefficient table in a storage medium, wherein the DCT

coefficient bit stream table includes pairs composed of DCT coefficient bit streams and

beck pixel data, the block pixel data providing inverse-DCT information of the

corresponding DCT coefficient bit stream (Owen: column 8, line 59, through column 9,

line 5). Owen does not specifically disclose looking up the DCT bit stream table when

receiving a VLD decoded DCT input stream to find whether the new DCT coefficient

matrix matches a DCT coefficient matrix; and utilizing the block pixel data

corresponding to the matched DCT coefficient bit stream to generate inverse-DCT data

of the DCT input bit stream if the DCT bit stream table includes the matched DCT

coefficient bit stream. However, Wee discloses selective re-use of compression data,

including looking up the DCT bit stream table when receiving a VLD decoded DCT input

stream to find whether the new DCT coefficient matrix matches a DCT coefficient matrix

(Wee: column 4, lines 31-36); and utilizing the block pixel data corresponding to the

matched DCT coefficient bit stream to generate inverse-DCT data of the DCT input bit

stream if the DCT bit stream table includes the matched DCT coefficient bit stream

(Wee: column 3, lines 47-55). Since both Owen and Wee disclose methods of

processing video data and performing motion compensation, one of ordinary skill in the

art at the time of the invention would have found it obvious to combine their teachings in

order to provide a computationally efficient method for motion compensation. The

combined system of Owen and Wee has all of the features of claim 1.

Re **claim 2**, the combined system of Owen and Wee discloses the steps of

decoding the DCT bit stream (Owen: column 7, lines 54-60) and saving the decoded

result into the DCT bit stream table if the DCT input stream fails to matched any DCT

reference bit stream in the DCT bit stream table (Owen: column 8, lines 22-25, 39-41,

and column 8, line 59, through column 9, line 5).

Re **claim 3**, the combined system of Owen and Wee discloses the step of

compressing the decoded result saved in the DCT bit stream (Owen: column 8, line 59,

through column 9, line 5).

Re **claim 4**, the combined system of Owen and Wee discloses a majority of the

features of claim 4, as discussed above in claim 1. Owen does not specifically disclose

that the blocks match if they are identical. However, Wee discloses an instance where a

block of the video frame is unchanged so the previously stored data for the

corresponding block is re-used (Wee: Fig. 8, code = '00'; column 5, lines 30-33). Since

both Owen and Wee disclose methods of processing video data and performing motion

compensation, one of ordinary skill in the art at the time of the invention would have

found it obvious to combine their teachings in order to provide a computationally

efficient method for motion compensation.

Re **claim 5**, the combined system of Owen and Wee discloses a majority of the

features of claim 5, as discussed above in claim 1. Owen does not specifically disclose

that the DCT input bit stream and the DCT reference bit stream are matched if a

difference of the DCT input bit stream and the DCT reference bit stream is lower then a

predetermined threshold. However, Wee discloses that the blocks match if the amount

of change is below a predetermined threshold (Wee: Fig. 8/183; column 8, lines 26-33).

Since both Owen and Wee disclose methods of processing video data and performing

motion compensation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to provide a computationally efficient method for motion compensation.

Re **claim 6**, the combined system of Owen and Wee discloses a majority of the features of claim 6, as discussed above in claim 1. Owen does not specifically disclose re-using the data from a reference block in a new frame when the reference block is identical to the block from the new frame. However, Wee discloses using previously stored video data if a match occurs between blocks (Wee: column 5, lines 30-33). Since both Owen and Wee disclose methods of processing video data and performing motion compensation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to provide a computationally efficient method for motion compensation.

Re **claim 7**, the combined system of Owen and Wee discloses a majority of the features of claim 6, as discussed above in claim 1. Owen does not specifically disclose that a threshold value is compared to a weighted difference of compressed DCT coefficients of at least one previously saved block and a target block for determining the similarity. However, Wee discloses using pixel difference values for motion compensation (Wee: column 2, lines 25-28) and that the blocks match if the amount of change is below a predetermined threshold (Wee: Fig. 8/183; column 8, lines 26-33). Since both Owen and Wee disclose methods of processing video data and performing motion compensation, one of ordinary skill in the art at the time of the invention would

have found it obvious to combine their teachings in order to provide a computationally

efficient method for motion compensation.

Re **claim 8**, neither Owen nor Wee specifically discloses that when a weighted

difference between at least one previously saved block stream and a target block

stream is applied to determine whether a lossy decoding is applied in decompressing

the video bit stream. However, The Examiner takes Official Notice that when

performing block matching, compression is lossless when the difference is large,

because this indicates that the blocks are unrelated and subsequently processed

independently of the other blocks. When the block differences are within a threshold

range, there is some correlation, but the blocks are not identical. Therefore, one of

ordinary skill in the art at the time of the invention would have found it obvious that when

a difference value is near a threshold, meaning that the target and reference blocks are

very similar in value but not identical, there is some loss in accuracy implied by the

difference when re-using data from previous frames.

Re **claim 9**, Owen does not specifically disclose that one of previously saved

decoded blocks is selected to represent a target block if a weighted sum of DCT

coefficient difference between a target block and the closest block saved in the storage

is less than a predetermined threshold. However, Wee discloses that the blocks match

if the amount of change is below a predetermined threshold (Wee: Fig. 8/183; column 8,

lines 26-33). Wee further discloses that the previously stored video data is re-used if

the difference falls below a threshold (Wee: Fig. 8/183). Since both Owen and Wee

disclose methods of processing video data and performing motion compensation, one of

ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to provide a computationally efficient method for motion compensation.

Re **claim 10**, neither Owen nor Wee specifically discloses that a compressed bit stream and the corresponding decoded pixels of farthest distance from a target block can be overwritten when the storage device of storing compressed bit stream and decoded pixel is short of space. However, The Examiner takes Official Notice that one of ordinary skill in the art at the time of the invention would have found it obvious to delete the data least relevant to the present operation first in order to create space on a memory for information in the present operation if free space is limited, thus creating an efficient way of managing the limited memory space.

Re **claim 11**, the combined system of Owen and Wee discloses that a decompressed bit stream is compressed before being stored to a buffer for future representing a new block stream (Owen: column 8, line 59, through column 9, line 5).

Re **claim 12**, neither Owen nor Wee specifically states that a decompressed bit stream is compressed through a lossless compression mechanism before being stored to a buffer and is decompressed for future representing a new block stream. However, The Examiner takes Official Notice that one of ordinary skill in the art at the time of the invention would have found it obvious that a block which is stored to be used as a reference block for future comparisons and re-use would be compressed with as little loss as possible in order to ensure accurate block matching and representation.

Re **claim 16**, Owen discloses an apparatus for decoding a video stream,

comprising: a bit stream decoding unit including a VLD, variable length deciding and

reconstructing the video bit stream to DCT matrix and a DeQuantization unit multiplying

the DCT matrix to inverse transforming and recovering the block of pixel matrix (Owen:

column 7, line 54, through column 8, line 6); a storage device for storing compressed

video data stream and corresponding decompressed pixel data of at least one previous

block (Owen: column 8, line 59, through column 9, line 5). Owen does not specifically

disclose a circuit of comparing a coming compressed stream to at least one previously

saved stream; and a circuit of selecting one of previously saved decoded blocks to

represent a target block if a target block is identical to one of the previously saved

blocks. However, Wee discloses selective re-use of compression data, including a

circuit of comparing a coming compressed stream to at least one previously saved

stream (Wee: column 4, lines 31-36); and a circuit of selecting one of previously saved

decoded blocks to represent a target block if a target block is identical to one of the

previously saved blocks (Wee: column 3, lines 47-55). Since both Owen and Wee

disclose methods of processing video data and performing motion compensation, one of

ordinary skill in the art at the time of the invention would have found it obvious to

combine their teachings in order to provide a computationally efficient method for

motion compensation. The combined system of Owen and Wee has all of the features

of claim 16.

Re **claim 17**, the combined system of Owen and Wee discloses a majority of the

features of claim 17, as discussed above in claim 16. Owen does not specifically

disclose that an output of a comparator is used to select the decoded pixels to represent the target block pixels. However, Wee discloses that an output of a comparator is used to select the decoded pixels to represent the target block pixels (Wee: column 5, lines 11-32; column 8, lines 58-65). Since both Owen and Wee disclose methods of processing video data and performing motion compensation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to provide a computationally efficient method for motion compensation.

Re **claim 18**, the combined system of Owen and Wee discloses a majority of the features of claim 18, as discussed above in claim 16. Owen does not specifically disclose that decoded block pixels represent the target block pixels by copying the decoded block pixels. However, Wee discloses that decoded block pixels represent the target block pixels by copying the decoded block pixels (Wee: column 5, lines 27-33). Since both Owen and Wee disclose methods of processing video data and performing motion compensation, one of ordinary skill in the art at the time of the invention would have found it obvious to combine their teachings in order to provide a computationally efficient method for motion compensation.

Re **claim 20**, the combined system of Owen and Wee discloses a majority of the features of claim 20, as discussed above in claim 16. Owen does not specifically disclose that in decompressing an I-type frame and JPEG still pictures, one of previously decoded and saved blocks is selected to represent the target block. However, Wee discloses that in decompressing an I-type frame and JPEG still pictures one of previously decoded and saved blocks is selected to represent the target block

(Wee: column 7, lines 10-27). Since both Owen and Wee disclose methods of

processing video data and performing motion compensation, one of ordinary skill in the

art at the time of the invention would have found it obvious to combine their teachings in

order to provide a computationally efficient method for motion compensation.

Conclusion

5.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure:

a.   Quantizing and dequantizing circuitry for an image data companding

device

Ito (US 5430556 A)

b.   Image encoding apparatus and image decoding apparatus

Yokose et al. (US 6782133 B2)

c.   Compression circuitry for generating an encoded bitstream from a plurality

of video frames

Bolton (US 20030231710 A1)

d.   Method of compression-coding a motion picture and an apparatus for

same

Fujihara (US 5530479 A)

e.   Coding method and apparatus for resampling and filtering images using

discrete cosine transforms

Wober et al. (US 5740284 A)

f.   Conversion system using programmable tables for compressing transform coefficients

Ouyang (US 5835145 A)

g.   System and method for performing motion estimation in the DCT domain with improved efficiency

Lempel (US 5796434 A)

6.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Findley whose telephone number is (571) 270-1199. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272-7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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